

Form PTO-1390 (REV 10-95) <b>TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371</b>		ATTORNEY'S DOCKET NUMBER <b>3848-010272</b>	
INTERNATIONAL APPLICATION NO. <b>PCT/BR00/00063</b>		U S APPLICATION NO. <i>09/763135</i> INTERNATIONAL FILING DATE <b>15.06.00 (June 15, 2000)</b>	PRIORITY DATES CLAIMED <b>17.06.99 (June 17, 1999)</b>
<b>TITLE OF INVENTION</b> <b>AN UNDERGROUND RESERVOIR FOR STORING LIQUID PRODUCTS AND A PROCESS FOR MANUFACTURING AN UNDERGROUND RESERVOIR</b>			
<b>APPLICANT(S) FOR DO/EO/US</b> <b>David SENEOR</b>			
<p>Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information</p> <ol style="list-style-type: none"> <li>1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U S C. 371.</li> <li>2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U S C. 371.</li> <li>3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U S C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U S C. 371(b) and PCT Articles 22 and 39(1).</li> <li>4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.</li> <li>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U S C. 371(c)(2)) <ul style="list-style-type: none"> <li>a. <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau)</li> <li>b. <input checked="" type="checkbox"/> has been transmitted by the International Bureau</li> <li>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US)</li> </ul> </li> <li>6. <input type="checkbox"/> A translation of the International Application into English (35 U S C. 371(c)(2))</li> <li>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U S C. 371(c)(3)) <ul style="list-style-type: none"> <li>a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau)</li> <li>b. <input type="checkbox"/> have been transmitted by the International Bureau</li> <li>c. <input type="checkbox"/> have not been made, however, the time limit for making such amendments has NOT expired</li> <li>d. <input checked="" type="checkbox"/> have not been made and will not be made</li> </ul> </li> <li>8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U S C. 371(c)(3))</li> <li>9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U S C. 371(c)(4))</li> <li>10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U S C. 371(c)(5))</li> </ol> <p><b>Items 11. to 16. below concern document(s) or information included:</b></p> <ol style="list-style-type: none"> <li>11. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98</li> <li>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included</li> <li>13. <input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment <ul style="list-style-type: none"> <li><input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.</li> </ul> </li> <li>14. <input type="checkbox"/> A substitute specification</li> <li>15. <input type="checkbox"/> A change of power of attorney and/or address letter</li> <li>16. <input checked="" type="checkbox"/> Other items or information <ul style="list-style-type: none"> <li>a. WO 00/78641 A1 - Front Page with Abstract, Specification, Claims, Drawings and Search Report (12 pp.)</li> </ul> </li> </ol>			

U.S. APPLICATION NO. <small>as known, see 37 CFR 1.17</small> <b>09/763135</b>	INTERNATIONAL APPLICATION NO PCTBR00/00063	ATTORNEY'S DOCKET NUMBER 3848-010272										
<p>17. <input checked="" type="checkbox"/> The following fees are submitted</p> <p><b>BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)):</b></p> <table> <tr> <td>Search Report has been prepared by the EPO or JPO .....</td> <td>\$860.00</td> </tr> <tr> <td>International preliminary examination fee paid to USPTO (37 CFR 1.482) .....</td> <td>\$690.00</td> </tr> <tr> <td>No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) .....</td> <td>\$710.00</td> </tr> <tr> <td>Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO .....</td> <td>\$1,000.00</td> </tr> <tr> <td>International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) .....</td> <td>\$100.00</td> </tr> </table>		Search Report has been prepared by the EPO or JPO .....	\$860.00	International preliminary examination fee paid to USPTO (37 CFR 1.482) .....	\$690.00	No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) .....	\$710.00	Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO .....	\$1,000.00	International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) .....	\$100.00	CALCULATIONS PTO USE ONLY
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<b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>		\$ 860.00										
<p>Surcharge of <b>\$130.00</b> for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).</p>		\$ 130.00										
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE									
Total claims	8 - 20	0	X \$18.00	\$ 0.00								
Independent claims	2 - 3 =	0	X \$80.00	\$ 0.00								
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00	\$ 0.00								
<b>TOTAL OF ABOVE CALCULATIONS =</b>			\$ 990.00									
Reduction of 1/2 for filing by small entity, if applicable. The above applicant is entitled to claim small entity status in the United States (Note 37 CFR 1.9, 1.27, 1.28)			\$ 495.00									
<b>SUBTOTAL =</b>			\$ 495.00									
Processing fee of <b>\$130.00</b> for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f))			\$ 0.00									
<b>TOTAL NATIONAL FEE =</b>			\$ 495.00									
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31)			\$ 0.00									
<b>TOTAL FEES ENCLOSED =</b>			\$ 495.00									
			Amount to be: refunded	\$								
			charged	\$								
<p>a. <input checked="" type="checkbox"/> A check in the amount of <b>\$ 495.00</b> to cover the above fees is enclosed</p> <p>b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed</p> <p>c. <input checked="" type="checkbox"/> The Assistant Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No <u>23-0650</u>. A duplicate copy of this sheet is enclosed</p>												
<p>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</p>												
<p>SEND ALL CORRESPONDENCE TO Richard L. Byrne 700 Koppers Building 436 Seventh Avenue Pittsburgh, Pennsylvania 15219-1818 Telephone: (412) 471-8815 Facsimile: (412) 471-4094</p>												
 <table> <tr> <td>SIGNATURE</td> <td>Richard L. Byrne</td> </tr> <tr> <td>NAME</td> <td></td> </tr> <tr> <td>28,498</td> <td></td> </tr> <tr> <td>REGISTRATION NUMBER</td> <td></td> </tr> </table>					SIGNATURE	Richard L. Byrne	NAME		28,498		REGISTRATION NUMBER	
SIGNATURE	Richard L. Byrne											
NAME												
28,498												
REGISTRATION NUMBER												

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of :  
**David SENEOR** : **AN UNDERGROUND RESERVOIR  
FOR STORING LIQUID PRODUCTS  
AND A PROCESS FOR MANUFACTURING  
AN UNDERGROUND RESERVOIR**  
 International Application :  
 No. PCT/BR00/00063 :  
 International Filing Date :  
 15 June 2000 :  
 Priority Date Claimed :  
 17 June 1999 :  
 Serial No. Not Yet Assigned :  
 Filed Concurrently Herewith :

Pittsburgh, Pennsylvania  
 February 16, 2001

**LETTER RECOGNIZING ATTORNEYS**

**BOX PCT**  
 Assistant Commissioner for Patents  
 Washington DC 20231

Sir:

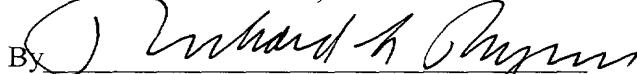
Enclosed are appropriate papers for initiating the national phase of the above-identified PCT application, comprising a specification, claims, drawings and search report. A Preliminary Amendment is also enclosed.

Please accept the application for purposes of granting a filing date and recognize Richard L. Byrne, Russell D. Orkin and Paul M. Reznick, Registration Nos. 28,498, 25,363 and 33,059, respectively, as attorneys in this application, pending the filing of a formal Declaration and Power of Attorney.

Kindly direct all communications relating to this application to **Richard L. Byrne**.

Respectfully submitted,

WEBB ZIESENHEIM LOGSDON  
 ORKIN & HANSON, P.C.

By 

Richard L. Byrne, Reg. No. 28,498  
 Attorney for Applicants  
 700 Koppers Building  
 436 Seventh Avenue  
 Pittsburgh, PA 15219-1818  
 Telephone: 412/471-8815  
 Facsimile: 412/471-4094

3-1  
PCT/BR00/00063

PATENT APPLICATION/PCT  
Attorney Docket No. 3848-010270

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of :  
**David SENEOR** : **AN UNDERGROUND RESERVOIR  
FOR STORING LIQUID PRODUCTS  
AND A PROCESS FOR MANUFACTURING  
AN UNDERGROUND RESERVOIR**  
International Application :  
No. PCT/BR00/00063 :  
International Filing Date :  
15 June 2000 :  
Priority Date Claimed :  
17 June 1999 :  
Serial No. Not Yet Assigned :  
Filed Concurrently Herewith :  
Pittsburgh, Pennsylvania  
February 16, 2001

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
Washington, DC 20231

Sir:

Prior to initial examination, please amend the above-identified patent application  
as follows:

**IN THE SPECIFICATION:**

Page 1, lines 4 and 5, change the following headings to appear as follows:

**--BACKGROUND OF THE INVENTION**

**Field of the Invention--.**

Page 4, before line 22, insert the following heading:

**--SUMMARY OF THE INVENTION--.**

Page 5, line 7, change the following heading to appear as follows:

--BRIEF DESCRIPTION OF THE DRAWINGS--.

Page 5, line 17, change the following heading to appear as follows:

--DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT--.

**IN THE CLAIMS:**

Please amend claims 1-4, 7 and 8 as follows:

1. (Amended) An underground reservoir for storing liquid products, comprising an inner, [or] main reservoir made from a material having well-known strength characteristics, such as a carbon steel typically used in the industry, and an outer, [or] secondary reservoir comprising a coating layer, said coating layer being formed by an inner layer made from an impervious paper and an outer layer made of polyurethane.

2. (Amended) The underground reservoir of claim 1, wherein said impervious paper is [preferably] a latex-based paper having a suitable strength.

3. (Amended) The underground reservoir of claim 1, wherein said outer layer made of polyurethane is [preferably] made of pure polyurethane, without the addition of any solvents.

4. (Amended) A process for manufacturing an underground reservoir comprising the steps of

providing an inner, [or] main reservoir made from a material having known strength characteristics, such as carbon steel typically used in the industry, and

5 covering [the] an outer surface of said main reservoir with a first coating layer made from an impervious paper, and applying [an] a second polyurethane-based coating layer over said first coating layer.

7. (Amended) The process according to claim 4, wherein said second[, outer layer made of] polyurethane-based coating layer is [preferably] made of pure polyurethane, without the addition of any solvents.

8. (Amended) The process according to claim 7, wherein said second[, outer layer made of] polyurethane-based coating layer [preferably] has a desired minimum thickness.

**IN THE ABSTRACT:**

After the claims, please insert a page containing the Abstract Of The Disclosure, which is attached hereto as a separately typed page.

**REMARKS**

The specification has been amended to place the application in conformance with standard United States patent practice.

Claim 1-4, 7 and 8 have been amended in order to bring the claims into conformance with standard United States patent practice.

An Abstract Of The Disclosure has been added as a separately typed page to be inserted after the claims.

Examination and allowance of pending amended claims 1-8 are respectfully requested.

Respectfully submitted,

WEBB ZIESENHEIM LOGSDON  
ORKIN & HANSON, P.C.

By Richard L. Byrne  
Richard L. Byrne, Reg. No. 28.498

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# AN UNDERGROUND RESERVOIR FOR STORING LIQUID PRODUCTS AND A PROCESS FOR MANUFACTURING AN UNDERGROUND RESERVOIR

## **ABSTRACT OF THE DISCLOSURE**

The present invention relates to an underground reservoir for storing liquid products comprising an inner or main reservoir made from a material having known strength characteristics, such as a carbon steel typically used in the industry, and an outer or secondary reservoir comprising a coating, said coating comprising an inner layer made from an impervious paper and an outer polyurethane-based layer. The present invention also relates to a process for manufacturing said reservoir.

THE JOURNAL OF CLIMATE

## Specification

"AN UNDERGROUND RESERVOIR FOR STORING LIQUID PRODUCTS AND A PROCESS  
FOR MANUFACTURING AN UNDERGROUND RESERVOIR"

## Background of the Invention

## 5 Field of the Invention

The present invention is generally directed to storage devices and, more specifically, to a tank or reservoir particularly designed for storing liquid products below the ground surface which is provided with an outer anticorrosion protective cover for 10 efficiently controlling and monitoring an eventual leakage of the stored liquid. Under another aspect, the present invention is directed to a process for the manufacture of such underground reservoir having an outer anticorrosion protective layer.

## Description of the Prior Art

15 A problem with tanks or reservoirs used for storing liquid products at a level below the ground surface, such as those used in fuel sale stations, is that they are frequently structurally deteriorated in view of the aggressive environment in which the same are used.

20 Indeed, the relatively high corrosion degree of the environment surrounding the tank attacks the material from which the reservoir is manufactured and tends to speed up the corrosion thereof, resulting in a general degradation of its structure which may lead to the occurrence of leaks.

25 An underground reservoir structurally corroded, besides allowing the leakage of the product stored inside same and, as a consequence, the inadmissible contamination of the surrounding environment, thus increasing the well known risks of pollution, can allow the water to infiltrate into same, what can hamper the 30 quality of the product being commercialized.

Since the costs related to the replacement of such an underground reservoir for storing liquid products can be prohibitively high, without mentioning the problems resulting from the required partial interruption of the traffic along the surface 35 roads close to the place where the same is being installed, a regular replacement of such reservoirs is unfeasible.

A solution which has previously been attempted to solve the foregoing problem was the installation of continuous cathodic protection anodes, such as cable, tape and tubular

anodes, buried close to the underground metallic structures such as pipes or storage tanks for protecting same against corrosion.

The anodes provide protection for the reservoir by increasing the electric potential of the ground surrounding same through the application of a direct current to the anode and the ground at a potential enough to keep the reservoir under a negative voltage with relation to the anode and, thus, to protect the metallic surface of the reservoir against any attack.

Typically, the anode is encapsulated in a carbon material such as powdered coke particles to increase the flow of the input current. The anodes are flexible and deemed to be "continuous" in view of the fact that they are elongated and tubular in shape, and can be laid along the reservoir.

This solution, however, is too much expensive and does not fully eliminate the problem of corrosion caused by chemicals on the outer metallic surface of the underground reservoir being used as a supplementary protection means against corrosion in grounds having a high potential.

Another solution previously proposed to address the problem of the attack against the inner and outer walls of the reservoirs was the manufacture of coated or jacketed tanks or reservoirs, that is, having an inner or primary compartment for storing the liquid product and an outer or secondary compartment having slightly larger inner dimensions than those of the inner reservoir, the purpose of which is to function as a protection shield for the inner reservoir.

Typically, in accordance with the constructive dispositions known in the state of the art, such coated or jacketed reservoirs are comprised of tanks having a double steel-steel wall comprising an inner reservoir made from carbon steel in the interior of which the liquid product is stored, and an outer reservoir which is also made from carbon steel and serves as a protection against the corrosion of the main reservoir by agents from the ground and also as a containment barrier in the event of a leakage. There is a minimum gap (interstice) between the two tanks within which a sensor for detecting the presence of liquids is installed on its lowermost point, in order to monitor any leakage that may eventually take place.

Another solution mostly used in view of its lower

cost than that of the double steel walls tank is the use of a coated or jacketed reservoir in which the outer or secondary tank is made from fiberglass.

However, such coated or jacketed reservoirs in accordance with the known state of the art present several technical and/or functional disadvantages, among which the following ones can be cited:

The jacketed reservoirs provided with double steel walls are too heavy, thus making the installation of same difficult and expensive due to the need of using larger capacity lifting devices (cranes). .

Another problem of such jacketed reservoirs provided with double steel walls is that the process for manufacturing same is laborious and the time for producing same is too long.

15 The drawback of such coated or jacketed reservoirs provided with double walls made from steel and fiberglass is the fact that the production process involving fiberglass is unhealthy and dangerous because of the toxic and explosive/flammable nature of the materials used in this process,  
20 such as acetone, catalysts and aromatic compounds, and thus the whole industrial process should be dealt with carefully, from the storage of raw materials to its application, what should be made in a place provided with an exhaustion and fire-fighting system.

### Summary of the Invention

25 Therefore, there is a need in the art for an underground reservoir for storing a liquid product which provides a solution for the problems discussed above related to the coated or jacketed reservoirs known in the state of the art, which is an object of the present invention.

30 Another object of the present invention is to provide such coated underground reservoir for storing liquid products which additionally provides a highly impact resistant coating.

An additional object of the present invention is to provide such coated underground reservoir for storing liquid products the coating of which can easily be repaired when damages are caused to same during the handling, transportation or installation of the reservoir.

Another additional object of the present invention is to provide such coated underground reservoir for storing liquid

products the coating material of which presents an excellent electric insulation, a characteristic that is important for the reservoirs designed for storing flammable products.

Another additional object of the present invention is  
5 to provide such coated underground reservoir for storing liquid products whose process of industrialization is extremely clean and non-toxic, for it does not involve toxic solvents or agents.

Still another additional object of the present invention is to provide such coated underground reservoir for  
10 storing liquid products whose process of industrialization is simpler and faster, has less operating steps, and uses less raw materials.

Another object of the present invention is to provide such coated underground reservoir for storing liquid products whose  
15 process of industrialization uses a small industrial area, without the need of systems for preventing fire and/or for exhausting the gases evolved from toxic agents.

Still another additional object of the present invention is to provide such coated underground reservoir for  
20 storing liquid products whose process of industrialization requires a minimum supply of raw materials.

In accordance with the present invention, such objects are accomplished through the provision of an underground reservoir for storing liquid products comprising an inner or  
25 main reservoir made from a material having known strength characteristics, such as a carbon steel typically used in the industry, and an outer or secondary reservoir comprising a coating layer, said coating layer being formed by an inner layer made from an impervious paper and an outer layer made of  
30 polyurethane.

In accordance with an aspect, the present invention is directed to a process for manufacturing an underground reservoir comprised of the steps of providing an inner or main reservoir made from a material having known strength characteristics, such  
35 as carbon steel typically used in the industry, blasting portions of the outer surface of said main reservoir to allow for the adherence of the outer coating, covering same with a first coating layer comprising an impervious paper, and applying an

outer layer to the pure polyurethane base, without adding any solvent, having a minimum thickness desired.

Other objects and characteristics of the present invention will be apparent from the following detailed description 5 of the preferred embodiment, taken in conjunction with the accompanying drawings.

#### Brief Description of the Drawings

The present invention will be additionally described here as follows, as a non-limiting example, with reference to its 10 presently preferred embodiment which is illustrated in the accompanying drawings, in which:

Figure 1 is a side sectional cut view of an underground reservoir for storing liquid products in accordance with the present invention; e

15 Figure 2 is an expanded side section view of the detail "A" of Figure 1.

#### Detailed Description of the Preferred Embodiment

A specific embodiment presently preferred of the present invention is illustrated as an example in the 20 accompanying drawings and will be described in details hereinafter. However, it should be understood that though the present invention is susceptible to several modifications and alterations in the form and dimensions, the purpose of the present specification is not to limit same to the particular 25 forms and/or dimensions described herein but, instead, to cover all the modifications and alternative embodiments that are within the spirit and scope of the invention, as defined by the accompanying claims.

With reference now more particularly to the 30 accompanying Figures, in which the same numerals have been used to indicate the same elements in the different views and, with particular reference to Figure 1, the coated reservoir in accordance with the present invention is illustrated as comprising a primary or inner reservoir 1 made from a material having a known 35 strength characteristic, such as carbon steel typically used in the industry.

The reservoir 1 is provided with a pipe 2 for feeding the liquid product to be stored, a pipe 3 for sucking the product stored for distribution, and a well 4 for the buoy (not

shown) of the sensor for detecting the presence of liquid, as well as a check point 5 the purpose of which is to allow for the verification of the integrity of the outer reservoir after it is assembled and even during and after the jacketed reservoir is 5 installed to the place it will be used.

As can be better seen from Figure 2, the primary or inner reservoir 1 is coated with a two-compound material comprising an inner layer 6 made from impervious paper, preferably based on latex, and an outer layer 7 based on pure 10 polyurethane, without the addition of any solvent, which it is applied and cured on the inner paper layer 6.

The process for manufacturing the tank coated in accordance with the present invention is quite simple and will be briefly described hereinafter.

15 After the main reservoir is constructed in accordance with the traditionally used manufacturing methods in the industries of the sector and, according to the applicable regulations, the same is subjected to a blasting process in specific areas of its outer surface, the purpose of which is to 20 assure the adherence of polyurethane to such areas.

In this step, depending on the type of the sensor for detecting the presence of liquid to be used, the well 4 for the buoy of the sensor should be formed, or in the case of an electronic sensor, the sensor should be installed.

25 Next, the outer surface area of the main reservoir is covered with impervious latex-based paper to form the inner coating layer 6.

After being coated with paper, the tank is conveyed to a painting station, wherein the outer polyurethane layer 7 is 30 applied through an airless process, until a layer of at least 2.5 mm of thickness is obtained.

35 After the effective cure of the coating material, tests should be carried out to guarantee the quality and tightness of the application (devices for measuring the thickness of the coating and pneumatically testing in the interstice).

The two-compound coating material resulting from the application of the inner paper layer and the outer polyurethane layer is particularly suitable for the intended purpose, because the paper layer provides the polyurethane with a tensile strength

that this chemical usually does not show, whereas the polyurethane layer provides the paper with a high strength to impacts that could rupture or cut said layer.

Additionally, besides being impervious, said two-  
5 compound material of the secondary reservoir is an electrically insulating non-metallic material, thus preventing the possibility of forming a galvanic couple that could speed up the corrosion of the inner reservoir.

The underground reservoir for storing liquid  
10 products in accordance with the present invention effectively solves the problems of the coated reservoirs known in the state of the art, thus additionally providing a coating with a high strength to impact, which can easily be repaired when damages are caused to same during the handling, transportation or  
15 installation from the reservoir and which presents excellent electric insulation characteristics, which is important to reservoirs designed for storing flammable products.

Also, the industrialization process of the underground reservoir for storing liquid products in accordance with the  
20 present invention is extremely clean and non-toxic, for it does not involve the use of toxic solvents or agents, is simpler and faster, has less operating steps, and uses less raw materials.

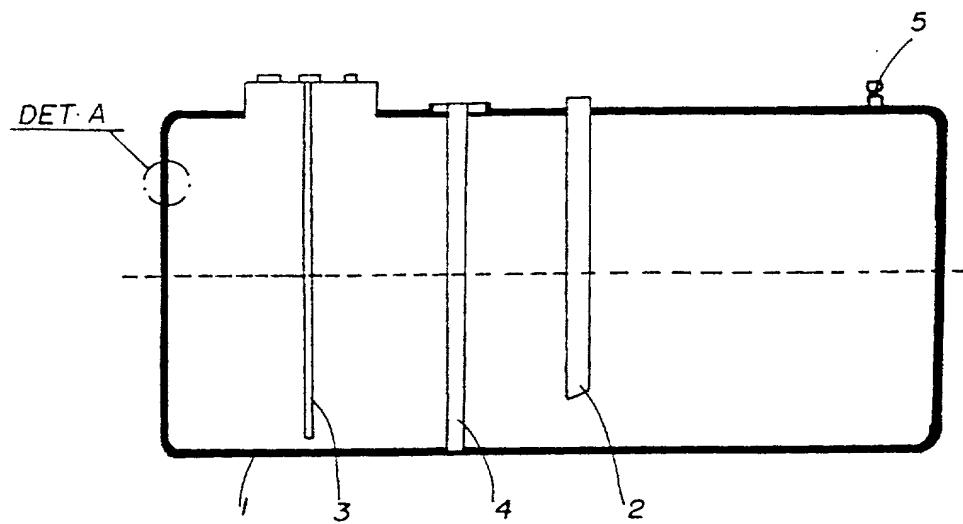
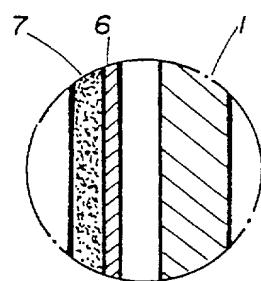
Additionally, the underground reservoir in accordance with the present invention only needs a small industrial area,  
25 without the need of special arrangements against fire and/or toxic agents, with a minimum supply of raw materials.

The best form of realization currently contemplated for the accomplishment of the present invention having been described and illustrated, several modifications and variations  
30 in its form of realization will be readily apparent to those skilled in the art. Therefore, it will be understood that the present invention is not limited to the practical aspects of the presently preferred embodiment illustrated and described herein, and that all such modifications and variations should be  
35 considered as being encompassed within the spirit and scope of the invention, such as defined in the accompanying claims.

"AN UNDERGROUND RESERVOIR FOR STORING LIQUID PRODUCTS AND A PROCESS  
FOR MANUFACTURING AN UNDERGROUND RESERVOIR"

Claims

1. An underground reservoir for storing liquid products, comprising an inner or main reservoir made from a material having well-known strength characteristics, such as a carbon steel typically used in the industry, and an outer or secondary reservoir comprising a coating layer, said coating layer being formed by an inner layer made from an impervious paper and an outer layer made of polyurethane.
2. The underground reservoir of claim 1, wherein said impervious paper is preferably a latex-based paper having a suitable strength.
3. The underground reservoir of claim 1, wherein said outer layer made of polyurethane is preferably made of pure polyurethane, without the addition of any solvents.
4. A process for manufacturing an underground reservoir comprising the steps of
  - providing an inner or main reservoir made from a material having known strength characteristics, such as carbon steel typically used in the industry, and
  - covering the outer surface of said main reservoir with a first coating layer made from an impervious paper, and
  - applying an second polyurethane-based coating layer over said first coating layer.
5. The process according to claim 4, additionally comprising the step of jet-blasting portions of the outer surface of said main reservoir to enhance the adhesion of said first coating layer.
6. The process according to claim 4, wherein said impervious paper is a latex-based paper.
7. The process according to claim 4, wherein said second, outer layer made of polyurethane is preferably made of pure polyurethane, without the addition of any solvents.
8. The process according to claim 7, wherein said second, outer layer made of polyurethane preferably has a desired minimum thickness.

FIG. 1FIG. 2  
DET. A

## Declaration and Power of Attorney For Patent Application

### English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

#### An Underground Reservoir for Storing Liquid Products and a Process for Manufacturing an Underground Reservoir

the specification of which

(check one)

is attached hereto.

was received on 16 February 2000 2001 as

Application Serial No.

09/763,135

and was amended on 16 February 2000 2001

(if applicable)

was filed as PCT international application

No. PCT/BR00/00063

on 15 June 1999 2000

and was amended under PCT Article 19 on

(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

#### Prior Foreign Application(s)

#### Priority Claimed

<u>PI 9902766-6</u> (Number)	<u>Brazil</u> (Country)	<u>17 June 1999</u> (Day/Month/Year Filed)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<u></u> (Number)	<u></u> (Country)	<u></u> (Day/Month/Year Filed)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u></u> (Number)	<u></u> (Country)	<u></u> (Day/Month/Year Filed)	<input type="checkbox"/> Yes	<input type="checkbox"/> No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Page 2 of 2

(Application Serial No.)

(Filing Date)

(Status)  
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)  
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

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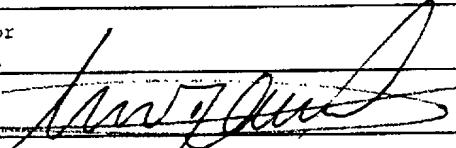
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Second inventor's signature

Date

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Supply similar information and signature for third and subsequent joint inventors.)